

and said epitaxial layer forming respectively drain and drift regions of said trench DMOS transistor cell.

Remarks

Claims 17-29 are pending and stand rejected. Claims 17, 20-21, 26 and 29 are amended to further define Applicants' invention.

Figures 1-7, 11 and 12 are amended to conform the drawings to the Specification.

The Specification is amended to correct typographical errors.

The Examiner objected to Figures 11 and 12, stating:

We further object to Figures 11 and 12 as being self-inconsistent with regard to the horizontal distance scale and particularly to dimensions indicated within the body of the figures. In Figure 11, for example,  $t_{\text{epi}} = 6.0$  microns is inconsistent with the horizontal scale suggesting 7.0 microns instead. We therefore request clarification in response to this office action.

Applicants believe that the amended drawings, which now conform to the Specification, overcome the Examiner's objection. Accordingly, Applicants respectfully request withdrawal of the Examiner's objection of Figures 11 and 12.

The Examiner further objected to Claim 28 under 37 C.F.R. § 1.83(a), on the basis that "an open cell configuration" is not shown in a drawing. Applicants respectfully traverse the Examiner's objection. Claim 28 is a claim which recites the combination of an open cell configuration, which relates to the topology of a trench structure, and the transistor cell of Claim 17. Although Figure 8 illustrates the trench transistor cell of Claim 17 using a closed cell configuration, Figure 9, for example illustrates the transistor of Claim 17 generally, i.e. regardless of the trench structure's topology. Since Claim 2 shows the open cell configuration, which the Examiner correctly pointed out as a conventional structure, Applicants respectfully submit that every feature of Claim 28 is

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illustrated in the drawings in compliance with 37 C.F.R. § 1.83(a).

As requested by the Examiner, Figures 1-7 are now labelled "Prior Art".

The Examiner objected to the Specification under 37 C.F.R. § 1.71 citing various inconsistencies between the Specification and the drawings due to typographical errors. As amended, Applicants believe that the Examiner's objection to the Specification under 37 C.F.R. § 1.71 is overcome.

The Examiner rejected Claims 17-29 under 35 U.S.C. § 112, first paragraph, stating antecedent bases problems in Claims 17 and 29. As amended, Applicants believe that Claims 17-29 are not vague and indefinite. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejection under 35 U.S.C. § 112, first paragraph, reconsideration and allowance of Claims 17-29.

The Examiner rejected the Specification under 35 U.S.C. § 112, first paragraph, stating:

its disclosure provides no basis whatsoever for the invention defined by Claim 28 requiring a trench DMOS transistor cell to have "an open cell configuration", as amply discussed supra under 37 C.F.R. 1.83(a). We thus conclude that the claimed "open cell configuration" is new matter not originally disclosed. We further conclude that the Applicants did not possess the open cell configuration at the time the invention was made.

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Vague and indefinite claim 28 is rejected under 35 U.S.C. 112, first paragraph, as set forth supra in the objection to the specification, because the claim is based upon a disclosure that not only provides no description of the Invention, but also provides no enabling method of manufacture.

Applicants respectfully submit that the Examiner is in error. The Specification discusses both the closed cell and the open cell configurations. In particular, beginning on page 5, line 37, to page 10, line 10, Applicants specifically discuss the closed cell and the open cell configurations and their relative merits. As Applicants explained earlier, the

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open cell configuration is conventionally known and is pertinent only to the topology of the trench structure. Although the manufacturing process described on pages 18-25 is described with the aid of Figures 21 to 31B, which are drawn to a closed cell configuration, it is clear that none of the process steps requires a closed cell configuration. Since Claim 28 recites a combination of the conventionally known open cell configuration and the transistor cell of Claim 17, which is a transistor cell equally applicable to the open cell and the closed cell configurations, Applicants believe that Claim 28 is fully supported by the Specification, as required by 35 U.S.C. § 112, first paragraph. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejection under 35 U.S.C. § 112, first paragraph, reconsideration and allowance of Claim 28.

The Examiner rejected Claims 17-29 under 35 U.S.C. § 103, based on Blanchard's '785 and '265 patents, stating:

In an alternative embodiment illustrated in Figure 10, Blanchard augments a P-minus-type body region with a P-plus type (37) for the expressed reason to alter electrical breakdown characteristics of the device illustrated in Figure 3. Discerning that Blanchard expected to form a trench DMOS transistor cell whereby a maximum depth of region (37) exceeds that of trench groove (31) and of P-minus-type body layer whereby a distance between the trench groove and region (37) exceeds a distance between the trench groove and an interposed P-minus-type body layer, we conclude it to have been obvious for one to have recognized therefrom the invention claimed.

In response to the Examiner's rejection of Claims 17-29, pursuant to 37 C.F.R. § 1.131, Applicants submit herewith a Declaration of Constantin Bulucea, setting forth a conception date of the subject matters of Claims 17-29 and diligence in constructively reducing such subject matters to practice. Since Figure 10 of the Blanchard '785 patent was first disclosed in the continuation-in-part application, serial no. 07/235,842, which matured into the '785 patent, Figure 10 of the '785 patent is entitled under 35 U.S.C. § 120 to a filing

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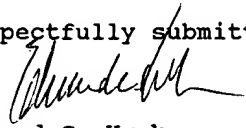
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date of August 24, 1988, but is not entitled to any of the priority dates of the related patent applications, as Figure 10 was not disclosed in these related applications. Therefore, Applicants respectfully submit that the Declaration of Constantin Bulucea overcome the Examiner's rejection under 35 U.S.C. § 103. Accordingly, Applicants request withdrawal of the Examiner's rejection under 35 U.S.C. § 103, reconsideration and allowance of Claims 17-29.

The Examiner also rejected Claim 17 under the judicially established doctrine of obviousness-type double patenting, as being unpatentable over Claim 2 of U.S. Patent 5,072,266 in view of the Blanchard '785 patent. Applicants believe that this double patenting rejection of Claim 17 is also overcome by the Declaration of Constantin Bulucea discussed above. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejection under the judicially established obviousness-type double patenting, reconsideration and allowance of Claim 17.

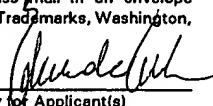
For the foregoing reasons, Applicants believe that all claims (i.e. Claims 17-29) are allowable, and accordingly request their allowance. If the Examiner's next action is other than allowance of all claims, a telephone interview with the Examiner is hereby requested. The undersigned Attorney for Applicant can be reached at 408-283-1222.

Respectfully submitted,

  
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